1.	Course title	**Bioinformatics algorithms**	
2.	Course code	BIO-Z-02	
3.	Study program	**Bioinformatics**	
4.	Unit offering the course	**FCSE**	
5.	Undergraduate/master/PhD	**Master**	
6.	Year/semester 1/winter/compulsory	7. ECTS: **6**	
8.	Teacher(s)	associate professor Slobodan Kalajdziski	
9.	Course prerequisites	None	
10.	Goals (competences): The student will be able to use existing algorithms developed for solving bioinformatics problems, and will also be able to develop their own algorithms.		
11.	Course content: In this subject will be taught basic algorithms and their advanced variations in problem solving. Special emphasis will be placed on their application in bioinformatics problems. The structure of the course will include: algorithms and their complexity, greedy algorithms, dynamic programming, divide and conquer algorithms, graph algorithms, combinatorial pattern recognition, clustering and trees, hidden Markov model, a probability algorithms, global / local alignment of pairs of sequences, aligning multiple sequences, patterns of substitution, searching databases of sequences, BLAST and its variations.		
12.	Teaching methods: Lectures supported by slide presentations, interactive lectures, trainings (using lab equipment and software packages), team work, case studies, invited guests and lectures, individual practical assignments presentations, seminar paper, e-learning (forums, consultations).		
13.	Total available time	6 ECTS x 30 hours = 180 hours	
14.	Distribution of the available time	120 + 0 + 60 = 180 hours	

15.	Teaching activities	15.1.	Lectures	120 hours
		15.2.	Training (labs, problem solving), seminar and team work	0 hours
16.	Other activities	16.1.	Project work	15 hours
		16.2.	Self study	15 hours
		16.3.	Home work	30 hours

17.	Grading		
	17.1.	Tests	65 points
	17.2.	Seminar work/project (written or oral presentation)	25 points
	17.3.	Active participation	10 points

18.	Grading criteria	to 59 points	5 (five) (F)
		from 60 to 68 points	6 (six) (E)
		from 69 to 76 points	7 (seven) (D)
		from 77 to 84 points	8 (eight) (C)

			from 85 to 92 points	9 (nine) (B)
			from 93 to 100 points	10 (ten) (A)
19.	Final exam prerequisites		Successfully completed activities 15.1 and 15.2	
20.	Course language		Macedonian and English	
21.	Quality assurance methods		Internal evaluation and student questionnaires	

22.	Literature					
	22.1.	Compulsory				
		No.	Authors	Title	Publisher	Year
		1.	Ingvar Eidhammer, Inge Jonassen, William R. Taylor	Protein Bioinformatics: An Algorithmic Approach to Sequence and Structure Analysis	Wiley, 1 edition	2004
		2.	David W. Mount	Bioinformatics: Sequence and Genome Analysis	Cold Spring Harbor Laboratory Press, 2 edition	2004
		3.	N. C. Jones, P. A. Pevzner	An introduction to bioinformatics algorithms	MIT Press	2004
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.				
		2.				
		3.				